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Vol. 53, pp. 135–154 December 19, 1940

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

EIGHTH SUPPLEMENT TO THE FLORA OF THE DISTRICT OF COLUMBIA AND VICINITY.

BY W. L. McATEE.

In view of plans for a manual of the flora[1] of a greatly enlarged region, including the area that has usually been adopted for publications on plants of the District of Columbia and vicinity, it seems desirable to summarize progress of knowledge since issuance of the Seventh Supplement[2] ten years ago. In the preparation of that publication and the present one, the writer has acted as a compiler only. He is not an expert botanist and owes much to the contributions of numerous individuals mentioned in the text. He is especially indebted to Neil Hotchkiss, F. J. Hermann, and S. F. Blake for critical comment as well as for notes on the flora. Doctors Hermann and Blake also have kindly gone over the manuscript and made numerous useful suggestions.

Bibliographical references to publications cited more briefly in the following pages are:

Bailey, L. H. Gentes Herbarum, I (5), Art. 6. Rubus: Enumeration of the Eubati (dewberries and blackberries) native in North America, pp. 203–297. 1925.

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Hitchcock, A. S., and Paul C. Standley (et al.). Flora of the District of Columbia and vicinity. Contr. U. S. National Herbarium, 21, 329 pp., 42 pls. 1919.
Cited as 1919 Flora.

Hotchkiss, Neil. Flora of the Patuxent Research Refuge,

[1] In charge of a Committee with E. H. Walker of the Smithsonian Institution as Chairman.
[2] Proc. Biol. Soc. Wash. 43, pp. 21–54, 1930.

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United States Department of the Interior
Bureau of Biological Survey

Wildlife Leaflet BS-161*

Washington, D. C. * May 1940

WILDLIFE TECHNOLOGY

By W. L. McAtee, Technical Adviser
Office of the Chief

The livest, the most widespread, and perhaps the most socially significant activity in the field of American biology today is the technology known as wildlife management. This technology derives its importance not from the logic of present conditions alone but also from belated recognition by the American people of the profligacy with which they have squandered their wildlife heritage. Originally unsurpassed by that of any other continent, American wildlife has been slaughtered and deprived of essential range until certain species have been exterminated and many others dangerously reduced in numbers.

The famed wild, or passenger, pigeon, once present in what we sidered inexhaustible myriads, is now only a memory. The buffalo, o existing in herds so filling the plains that they were never out of s pioneers on the march, day after day, for weeks on end, exists now on special reservations. Wildfowl once covered the waters, as pigeons the air, but in many areas they no longer appear and in all they have fraction of their former abundance. These are merely symbolic cases wildlife has suffered in the same way, if not to the same extent.

At last, and in some cases, as we know, too late, in others we in time, the American people have realized that provision must be mad wildlife if it is to continue to exist. Such provision must include merely better protection, but adequate allotment of lands on which wi may find refuge and safety for rearing its young, and finally intelli and sympathetic management, so that all facilities that can be devote wildlife shall have the greatest possible effect. A brighter day for life seems to have dawned, and wildlife management already has a well part in such new national cares as land-planning, rural resettlement, erosion control, as well as in the revitalized general conservation m

Origin and Present Status of Wildlife Technology

Wildlife technology had its origin in the search for better me game restoration on private estates, has been contributed to by some more permanently organized of the State conservation departments, and

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*Reissued with slight revisions from Leaflet BS-67 issued by the of Biological Survey under the Department of Agriculture in October 19

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BIOLOGIC BALANCE ON THE FARM

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#3

BY

W. L. McATEE

U. S. Biological Survey

FROM THE SMITHSONIAN REPORT FOR 1939, PAGES 319–323
(WITH 2 PLATES)

(PUBLICATION 3568)

SMITHSONIAN INSTITUTION
WASHINGTON
D. C.

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Reprinted from THE SCIENTIFIC MONTHLY, July, 1940, Vol. LI, pages 77–79.

ON SCHOLARLY WRITING AND CRITICAL REVIEWING

By W. L. McATEE

TECHNICAL ADVISER, BIOLOGICAL SURVEY, U. S. DEPARTMENT OF AGRICULTURE

THE SCHOLAR

A SCHOLAR is one who loves learning for its own sake and will peruse the record because he reveres it. He will never imitate those who write as if nothing had ever before been disclosed in their fields of inquiry. Certainly he will not agree with those who frankly say they are interested only in their own research and do not care what others may have done. He will realize that a well-rounded review is much more useful than scraps of new, or supposedly new, information. Failure to summarize previous work is lamentable not only as indicating ignorance or lack of appreciation of pioneer endeavor, but is furthermore actual treason to scholarship because it handicaps the education of later students. Giving due attention to previous work is by no means detached altruism, for it may result in many a suggestion or ripen many an inspiration bearing on the scientist's own studies. Knowing what has been done is especially useful in forestalling futile repetition of argument or research and in preventing foolish claims of originality. In a word, acquaintance with one's subject, the more complete the better, is advisable for the strictly practical reasons of avoiding mistakes and evading criticisms.

The aphorism that "Art is long and life is short," doubtless inspired in Hippocrates by the study of medicine, applies as well to most research. The difficulty of accumulating adequate material, the need of painstaking study and reflection to get the most out of it, the requirement that every profitable method of approach be utilized, both in the field and in the laboratory, and the necessity of collating pertinent knowledge from every related field so that findings may be properly interpreted—the overcoming of these difficulties and the satisfying of these needs are not the work of a moment. The scholar must, therefore, have patience and an underlying persistence in pursuit of the truth that is something far deeper and better than the more lauded, but often superficial and unproductive, trait called enthusiasm.

The scientist, the scholar searches for truth but accepts the fact that his findings are only approximations to the truth. He strives ever for verification of previous, and for accumulation of new, knowledge so that there may be better and better approximations to truth. He is therefore tentative in expression and humble, not dogmatic, in attitude. He does not perform research to get support for a belief or policy; he does not anticipate or predict the results of research; he awaits them. Because he has no fixed expectations, he is not disappointed by the way the finger of truth turns. What appears to be truth suffices for him and is accepted for what it seems to be worth until something better can be developed. Indeed, as he must have reverence for the past, must be industrious in his calling, exhibit not only persistence but patience and moderation and abide always by the truth so far as it is possible to know the truth, the scientist must exemplify in his own person about all the qualities implied in the phrase "a gentleman and a scholar."

SCHOLARLY WRITING

To be scholarly in writing means to manifest learning. Good composition

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Reprinted from THE AUK, Vol. 57, October, 1940, pp. 597–598

GURDON TRUMBULL was one of those elected to the class of Fellows in the earlier years of the American Ornithologists' Union, when custom permitted the election of candidates directly. This signal honor unquestionably was in recognition of the excellent qualities of his book on the 'Names and Portraits of Birds which interest Gunners.' The work was published in 1888 and on November 15 of that year at a Washington meeting, Trumbull was elected Fellow; he qualified as Life Fellow the following year.

The 'Names and Portraits' evidently made a most favorable impression. Elliott Coues, in one of his characteristic reviews (Auk, 5: 414–418, 1888), said: "The serious defects and very numerous faults of this treatise are those which we have not discovered and therefore decline to mention," and continuing more seriously he referred to it as "this remarkable work . . . this delightful accession to our shelves." The present writer has paid tribute to the book in three former publications on local names of birds (Forest and Stream, 77: 172, July 29, 1911; Wilson Bull., 99: 74, 1917; U. S. Dept. Agric., circ. 13, p. 3, 1923) and again would call attention to it as an example of the solid and enduring value of work sincerely conceived and painstakingly executed. Years of field investigation were part of Trumbull's preparation for this compilation and all possible accuracy was exercised in recording the results. It is a classic in its field.

Although an artist, Trumbull did not attempt to illustrate this work but obtained the services of Edwin Sheppard of Philadelphia. Sheppard was as talented a delineator of birds as the period offered and his pencil drawings on stipple board meticulously made for full-size reproduction are marvels of craftsmanship. Trumbull prepared notes for a second edition of the 'Names and Portraits' but they were never sent to press. His manuscript and the originals of the Sheppard illustrations, which had been equally divided between author and publishers, have been deposited, through the courtesy of his widow and of the firm of Harper and Brothers, in the manuscript division of the Library of Congress.

His other ornithological writings (see terminal bibliography) were few but of high quality. In the Woodcock papers, he described and illustrated the forceps-like action of the bill, recorded observations on feeding habits, particularly of a captive bird, and discussed the vocal or mechanical origin of the birds 'twitter.' The articles on scoters described the plumages and shapes of bill (illustrated) characteristic of the sexes and ages of four species of *Oidemia*.

Gurdon Trumbull came of a family that included many distinguished contributors to New England, and especially Connecticut, history and culture. Only those of his immediate family, however, will here be mentioned. His father whose name he bore lived from 1790 to 1875. He was originally of Norwich where he was a volunteer in the War of 1812–14. He moved to Stonington, made a fortune in whale and seal fisheries, and held various public offices, including membership in the State General Assembly. At Stonington he married Sarah A. Swan and they had ten children, of whom three died in infancy. Those longest surviving included J. Hammond Trumbull, eminent authority upon American Indian languages, State Librarian, and Assistant Secretary of State of Connecticut; the Reverend Henry Clay Trumbull, Chaplain of the 10th Connecticut Volunteer Regiment in the Civil War, missionary, writer, and editor of the 'Sunday School Times' in Philadelphia; Annie Trumbull, popular writer and noted entomologist, who married Edward Slosson of New York; and Gurdon Trumbull, Jr.

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Reprinted from THE AUK, Vol. 57, July, 1940

AN EXPERIMENT IN SONGBIRD MANAGEMENT

BY W. L. MCATEE

A PROJECT for increasing the number of birds to control nut weevils in an orchard of blight-resistant chestnuts at the Bureau of Plant Industry Experiment Station near Glenn Dale, Maryland, was carried on cooperatively by that organization and the U. S. Biological Survey from 1926 to 1931. Entomological and management results have been reported in the papers listed in the terminal bibliography, and the more strictly ornithological findings are presented in this communication.

The area involved was about two and one-half acres the first two years and three and a half the last four. It was pretty fully occupied by the chestnut orchard and a rose garden, yet had ample openings. A bird bath, a martin house, and at the maximum 98 individual bird boxes including five sizes were installed. Response was good and, there being no hole-nesting species on the tract before, the threefold to fourfold increase in birds was clear gain. The bird population was multiplied but the nut weevils were not perceptibly reduced in numbers; their increase, however, may have been checked.

Ornithological gleanings are here summarized as 'Nest Analyses' and 'Nesting Results.'

NEST ANALYSES

On November 18, 1926, E. A. Preble helped me to collect twenty birds' nests from trees in the experimental chestnut orchard. Materials used in twelve of these (considered to be correctly identified) are reported on here. The insects and spiders using these nests as winter quarters were treated in papers by McAtee (1927b) and Malloch (1927b).

Building Materials

Tree Nests

Robin.—Three nests agreed in having weed stalks, dry grass, and mud in their foundations and fine dry grass for linings. One had a few twigs and another some leaves in their bases. In nest No. 1, a few grass seeds in the mud layer had sprouted, and in connection with an embedded garlic bulblet with its thread-like appendage, added fine green filaments to the lining. Nest No. 2 held a stratiomyid fly larva (*Odontomyia*) and three small bivalves (*Pisidium abditum*),

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Some Local Names of Plants—VII

W. L. McATEE

Separately printed without change of paging from TORREYA
41: 43-55. March-April, 1941

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Names of American Plants in Books on Kalm's Travels

Compiled by
W. L. McATEE

Separately printed without change of paging from TORREYA
41: 151-160. September-October. 1941

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Reprinted from THE SCIENTIFIC MONTHLY, December, 1941, Vol. LIII, pages 550–553.

AN INTERESTING BOOK

By W. L. McATEE

TECHNICAL ADVISER, FISH AND WILD LIFE SERVICE, U. S. DEPARTMENT OF THE INTERIOR

THE copy before me has the appearance appropriate to an interesting book of a certain degree of antiquity. Some of its pages are loose and worn; its back is broken; it has been scarred by service. It has passed through many hands and has been annotated by some of them. The notes but add to the interest of the volume.

The book is entitled, "The Market Assistant" and it was published at New York City in 1867 (455 pp.). Devoted to "what we eat," it is not, however, restricted in scope, but records anything and everything of interest connected with food. The quaint, the ordinary, the veritable and the speculative, all find place in its pages; it informs, surprises, pleases. Would you learn about market grafting and lying, or the origin of porterhouse steaks, the dangers of grand dinners or the introduction of potatoes to England, the carving of human dentures from cattle teeth, or the beginnings of fish culture, the author is your guide. He makes a point of naming individuals connected with "curious incidents and anecdotes," thus furnishing a happy hunting ground for the genealogically inclined. Sample entries are:

Adams, John Q., presented with a large Codfish,

Astor, John Jacob, presents the skin of a "white wild sheep,"

Beebe, Theophilius, assists to take a monster Vampyre of the ocean,

Braisted, G., takes a Spotted Gunnel out of an oyster,

Cadwallader, General, of Philadelphia, dines on a large Brook Trout,

Cooper, Peter, purchases cattle feet for making glue,

Dwight, Dr. Timothy, on the Horse Mackerel,

Greeley, Horace, on the flesh of the Prong Horn.

Others there are by the score. The conclusion may be that the author could have been the gossip columnist of his day. If that implication is an unpleasant one, the reviewer feels that it is unjustified, for our author deals only with subjects that are legitimate objects of human curiosity.

A previous work, "The Market-Book," by following the same custom of recording names, drew the fire of "An Indignant Gentleman" who objected to his ancestors being recorded as butchers. "If my grandfather chose the trade of butcher, why should I be blamed for it? . . . All that I can do is to denounce the author . . . as a reckless disturber of family pride. In behalf of many proud and wealthy families of New York, I [so] denounce him." The author, Thomas Farrington De Voe, did not share the views of this correspondent, for at the end of the preface he signs himself "Butcher." Evidently there are butchers and butchers and De Voe, by his works, stands forth also as a scholar, a historian and an artist. The well-executed frontispiece of "The Market Assistant" vouches for the third of these specifications, both of his books for the second, and his thorough gathering of their materials for the first. As a particular point of scholarliness, book users will appreciate the 20-page classified index. It was made to help them and it serves. The section called "general index" leads to all the "curious incidents and anecdotes" and shows that the author knew them to be a feature of his work that would be appreciated. Within proper limits of a review, their diversity can be no more than indicated. They deal much with large things or accom-

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Reprinted from THE SCIENTIFIC MONTHLY, October, 1941, Vol. LIII, pages 368–371.

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THOUGHTS ON SUBSPECIES

By W. L. McATEE

FISH AND WILDLIFE SERVICE, U. S. DEPARTMENT OF THE INTERIOR

RECOGNITION of avian subspecies has been the subject of comment more often aspersive and rancorous than judicial and broad-minded. The rank and file of American ornithologists and often, also, the leaders have dealt with subspecies as hard facts, to the neglect of underlying principles. Not a systematic ornithologist, the writer worked for twenty years on the classification of insects and described hundreds of species (as well as many subspecies and varieties) of those animals. This should be sufficient background for a discussion of subspecies, and experience with a group other than birds should give a detached point of view not easily attained, perhaps, by those who have been in the thick of the ornithological subspecies battle.

The writer has also been more or less deeply absorbed in bird study since boyhood and he has never worried about a subspecies yet. Why worry? There is no compulsion to deal with subspecies upon those who do not wish to do so. Oologists, especially, have denounced hair-splitting and name-changing, but why did not those who felt that way simply ignore subspecies? By taking them too seriously, they permitted others to rule their specialty. They need not have striven for a "set" of every additional form named; they could have made their own catalogue of what they deemed "good species" and have used it as standard in their guild.

Observers who study ornithology for pleasure (the vast majority) need not take account of subspecies—which are rarely subjects for field recognition anyway. These students legitimately may be, and mostly are, interested in birds primarily, in species, secondarily, and in subspecies, not at all. If necessity arises, they can read in some book what is known about the subspecies concerned.

The need for bird names on the part of ornithologists, who care not for subspecies, can be met entirely by a code of vernacular names of species (not provided, it must be admitted, by the current A.O.U. Check-List). These bird students, if they will, can go their way in peace wholly untroubled by the doings of the subspecies makers and check-list compilers.

What of those who do care for subspecies and want to use subspecific names? Considering the advantage they should have in commenting upon subspecies, some of their remarks have been about as pointless as those of ornithologists far less informed. For example, we read that "subspecies may be sharply defined or they may also be united by intermediates." This pronouncement ignores the very definition of subspecies; they are forms connected by intermediates; the "sharply defined" forms are species. Some have railed at subspecies because every collected specimen can not be promptly and positively identified. If the going were as easy as that, it would indicate that species, not subspecies, were being dealt with. Subspecies are not another kind of thing like species, but less well marked—no, they are fractions of species—colonies, the individuals of which are in no way trenchantly marked off from those of other colonies.

Often we read of "good" or of "poor" subspecies, terms that are not properly applied to segregates correlated with geography, physiography and ecology, and just as valid as the distinctions in their habitats whatever the degree of

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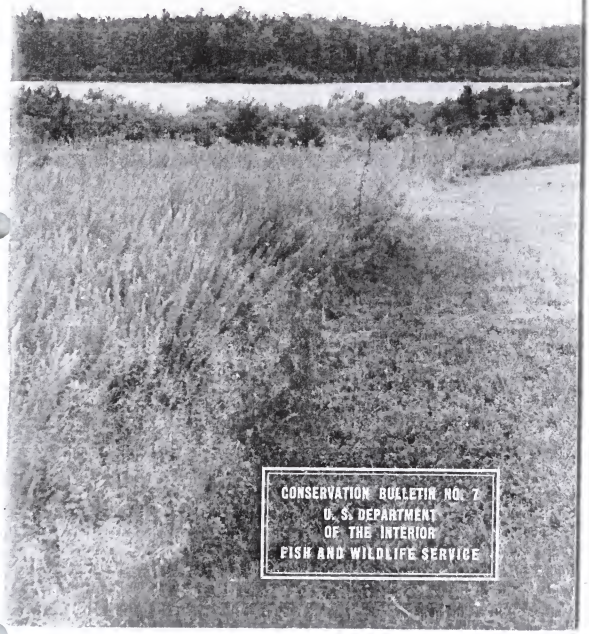
PLANTS
Useful In
UPLAND WILDLIFE MANAGEMENT



CONSERVATION BULLETIN NO. 7
U. S. DEPARTMENT
OF THE INTERIOR
FISH AND WILDLIFE SERVICE

UNITED STATES DEPARTMENT OF THE INTERIOR

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FISH AND WILDLIFE SERVICE

WILDLIFE OF THE ATLANTIC COAST SALT MARSHES

WILDLIFE CIRCULAR 11

HOMES for BIRDS

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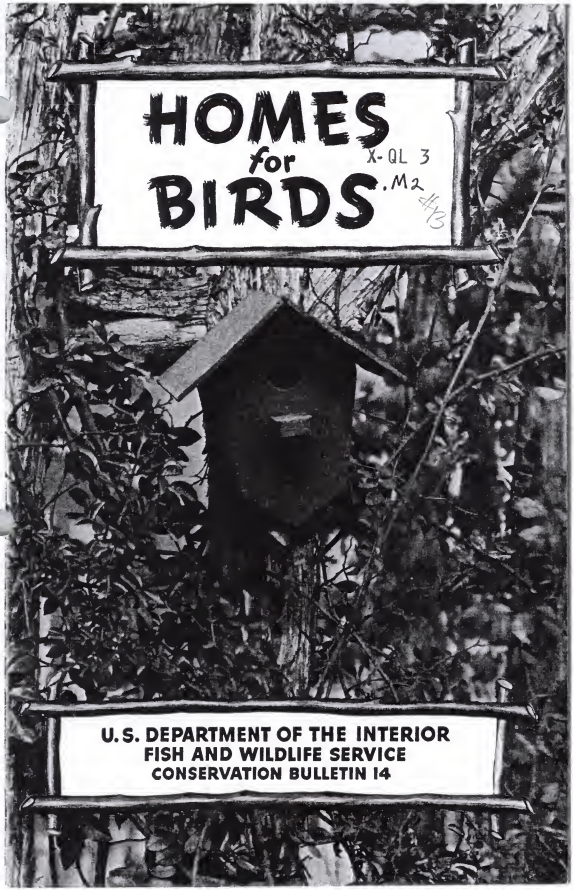

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
CONSERVATION BULLETIN 14

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Reprinted from THE WILSON BULLETIN, Vol. 54. No. 4. Dec., 1942. pp. 253–254

GENERAL NOTES

Ornithological Writings of the Late Prof. Frank Smith.—Compiled with the aid of Dr. Harley J. Van Cleave and Miss Alice S. Johnson of the University of Illinois.

1904 An unusual flight of sparrow hawks in Michigan in 1904. *Bull. Mich. Ornith. Club.*, 5(4), December: 77–78.

1906 A plan for a co-operative study of hird migration. *School Science and Mathematics*, 6(3), March: 224–225.

1907 Advantages of migration records in connection with hird study in schools. *School Science and Mathematics*, 7(3), March: 221–224.

1908 A migration flight of purple martins in Michigan in the summer of 1905. *Wilson Bulletin*, 20: 41–43.

1911 Double-crested cormorants breeding in central Illinois. *Auk*, 28(1), Jan., 16–19.

1915 The relation of our shrubs and trees to our wild birds. *Ill. Arbor and Bird Days*, 1915: 7–17, illus.

1915 The value of hirds to the gardener and fruit grower. *Trans. Ill. Hort. Soc.*, n.s., 48: 272–77.

1916 (See last title below)

1917 The correlation hetween the migratory flights of hirds and certain accompanying meteorological conditions. *Wilson Bulletin*, 29(1), March: 32–35.

1918 Bird migration and the weather. [*Ill.*] *Audubon Bull.*, 1918, Spring and Summer issue: 15–17.

1918 A snowy owl in captivity. [*Ill.*] *Audubon Bull.*, Spring and Summer issue: 24–25.

1921 Illinois hirds as travellers. *Ill. Arbor and Bird Days*, 1921: 21–29, 6 maps.

1922 Starling invaders arrive in Illinois. [*Ill.*] *Audubon Bull*, 1922, Spring issue: 16–17.

1922 The European starling in Illinois. *Trans. Ill. State Acad. Sci.* 15:185.

1925 Interesting results from hird-banding activities. *School Sci. and Math.*, 25(6): 569–573; also in *Trans. Ill. State Acad. Sci.*, 18: 107–112.

1930 Records of spring migration of hirds at Urhana, Illinois, 1903–1922. *Bull. Ill. Nat. Hist. Survey*, 19: 105–117.

N. A. WOOD, FRANK SMITH, and FRANK C. GATES

1916 The summer hirds of the Douglas Lake region, Cheboygan County, Michigan. *Univ. Mich. Mus. Zool. Occ. Papers* No. 27: 1–21.—W. L. MCATEE, *Fish and Wildlife Service, Merchandise Mart, Chicago, Illinois.*

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.M2 #15

Reprinted from THE AUK, Vol. 59, October, 1942, p. 613

PROFESSOR FRANK SMITH of the University of Illinois was an Associate of The American Ornithologists' Union from his election in 1909 until his death at St. Petersburg, Florida, February 3, 1942. Born at Winneconne, Wisconsin, February 18, 1857, he had attained a venerable age. He earned money to pay for higher education chiefly by teaching; graduated from Hillsdale College, Michigan, in 1885; later worked in marine biological laboratories at Annisquam, Massachusetts, and Newport, Rhode Island; and did graduate work at Harvard University, where he received the A.M. degree in 1893. In 1892 he taught biology in Trinity College, Hartford, Connecticut, and in 1893 went to the University of Illinois as instructor in zoology. He rose steadily through the faculty grades becoming Professor in 1913. He was also Curator of the University Museum of Natural History, 1900–1917. The honorary degree of D.Sc. was given him in 1923 by Hillsdale College, and in 1926 he retired from the University of Illinois as Professor Emeritus. In the rather long period of retirement (16 years) vouchsafed him, he lived chiefly at Hillsdale, Michigan, in summer and at St. Petersburg, Florida, in winter.

With a mathematical bent at first, his life-work was in zoology. While diverse, it was sufficiently concentrated upon the earthworms and their allies that he may be fairly said to have created the classification of these animals for North America. He also published on the earthworms of other lands and was a leading authority on fresh-water sponges. His printed contributions to ornithology (13 in number) relate principally to migration. He endeavored to stimulate and guide migration study in Illinois and to summarize the results.

This interest continued after his retirement when he carried on bird study at both his Michigan and Florida homes. He was a faithful attendant of the meetings of the St. Petersburg Audubon Society and of the Florida West Coast Bird Club. Those who have commented on Professor Smith's personality have emphasized his sincerity and thoroughness, modesty and helpfulness. 'Who's Who in America,' and 'American Men of Science' may be consulted for biographical details and 'Science' 95: 398–400, April 17, 1942) for a memorial by Paul S. Welch. For facts about Professor Smith, the present writer is indebted to Dr. Welch and also to William G. Fargo, Alice S. Johnson, H. R. Mills, Daisie M. Morrison, Francis M. Weston, and Harley J. Van Cleave.—W. L. MCATEE.

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Reprinted from THE CONDOR, Volume 44, Number 6, November-December, 1942, pp. 286-287

COMMUNICATION TO THE EDITOR

In its main outlines, a man's character is sketched early; time but deepens the etching. How "the child is father of the man" is further impressed upon me every time I read the charming biography of Charles Wallace Richmond in Gregory M. Mathews' great work on "The Birds of Australia" (Suppl. No. 4, 1925: iv-viii). Though unsigned, it is clearly identifiable by its whimsical humor as self-written.

From conversations with Richmond, the writer is able to describe one incident and to give details of two others, additional to the account cited and he has long had an urge to do something of the kind as a tribute to a lovable friend.

In his early collecting forays in what is now Rock Creek Park of the District of Columbia, Richmond was harassed by a certain policeman. From time to time the officer halted him but found no contraband. After a good deal of this hide and seek, Richmond was finally caught with the goods—a screech owl—and taken to court. The judge asked, "Don't you know you can't collect birds in the District of Columbia without a permit?" "Yes," replied Charlie, who had never mentioned permit to the officer, "here it is." Thereafter that particular policeman could no longer see him. The way in which this episode developed depended upon Richmond's personality and exemplifies the patiently humorous view of life that he held to the end.

One of the varied employments of Richmond's youth was as a page in Congress. In that period, opportunity threw in his way a quantity of passes to an exhibition in the Patent Office. The number being larger in his estimation than anyone could conceivably use, Charlie distributed a good many of them to acquaintances and the place of the exhibit was soon flooded with children. Investigation brought retribution, but who shall deny but that in the not wholly formed ethic of youth he felt fully justified in doing something for his friends. So regarded, this largess was an early example of an activity—helping others—of which he never wearied.

Many boys then indulged in bird-nesting but this was one boy with whom it was more than a passing fad. Nevertheless, he was surprised when he learned that there were grown men in the Smithsonian Institution who studied birds. Of course, he wanted to know them and he thought he might be better received if he came with a present. So bundling in a paper parcel some of his treasures—nests and eggs—he climbed the spiral stairs to the old dim and dusty Bird Gallery of the Smithsonian. At their head, he gave a shy knock on the first door, which was answered by a hearty, "come in." There sat a sandy-haired man with an impressive mustache that did nothing to decrease Richmond's awe. But the man, Robert Ridgway, saying, "Let's see what you have there sonny," helped to unwrap the package. Richmond was prepared to identify the contents but soon found that this was unnecessary, as Ridgway said, "So you've got a catbird's; and a cuckoo's, they're not so easy to find." On he went, commenting on every specimen, "And you want to give them to us, that's fine." His reception was so kindly, so beyond anything Richmond expected, that the boy was in ecstasy. In later life he never could think of the visit without the tears coming. His ambition from that moment was to be an ornithologist, to be like Mr. Ridgway.

And he was like him, especially in generosity. He was kind to many others as Ridgway was to him. Despite the best of will, we are often unable to repay our benefactors, but we can in a sense repay by aiding others. With a genius for friendly helpfulness, there can be no doubt that C. W. R. over and over again repaid his debt of kindness.—W. L. MCATEE.

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Reprinted from THE WILSON BULLETIN, vol. 54, No. 2, June, 1942, p. 140.

GENERAL NOTES

Works of North American Ornithologists.—An abstract of a paper presented at the twenty-seventh annual meeting of the Wilson Ornithological Club states, "there has been no simple published account of the works of the men who have influenced North American Ornithology" (*Wilson Bulletin*, 54, March, 1942: 69).

What the word "simple" implies in this connection is problematical. If it were omitted, the statement would be recognized as unfounded. At the risk, in this period of youth movement, of seeming too devoted to records of the past, I would point out that aside from being treated in biographies by the hundreds, the works of men who have influenced North American ornithology have been by no means neglected by competent reviewers.

The author of the paper mentioned appears to be acquainted with the resume by Coues, but that is only one of several recapitulations. Witness:

ALLEN, J. A.
1876 Progress of ornithology in the United States during the last century. *Amer. Nat.*, 10: 536–550.

CHAPMAN, F. M., and T. S. PALMER, Editors
1933 Fifty years' progress of American Ornithology 1883–1933. American Ornithologists' Union, Lancaster, Pa. (249 pp., frontispiece).
Chapters on 14 divisions of the subject by as many authors, together with introductory and concluding matter relative to the A.O.U. by the Editors.

COUES, ELLIOTT
1927 Key to North American birds, etc. 5th edition, 2 vols. Boston.
Historical preface. Vol. 1, pp. xi-xxvi.

FOWLER, S. P.
1862 Ornithology of the United States, its past and present history. *Proc. Essex Institute*, 2: 327–334.

PALMER, T. S.
1900 A review of economic ornithology in the United States. *Yearbook U. S. Dept. of Agriculture*, 1899: 259–292, pls. 6–8, 3 figs., tables.

STONE, WITMER
1899 Some Philadelphia ornithological collections and collectors, 1784–1850. *Auk*, 16: 166–177.
"During the first half of the present century Philadelphia stood preeminent in the American ornithological world. The large majority of our early ornithologists were Philadelphians, either by birth or residence."

The importance of bibliographical research can scarcely be over-estimated. A scientist should be wedded to the literature of his subject and as said of the ordinary marital relation, it will doubtless often prove that the partner is the better half.—W. L. MCATEE, *Wildlife Service, Washington, D.C.*

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Reprinted from THE SCIENTIFIC MONTHLY, June, 1942, Vol. LIV, pages 565–566.

THE SPECIMEN FETISH

By W. L. McATEE

WILDLIFE SERVICE, U. S. DEPARTMENT OF THE INTERIOR

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THE statement, "At least one specimen of every form listed has been examined by some qualified ornithologist," is typical of modern formal lists of birds. While recognizing that specimens must be collected to gain particular definite bits of information or to settle certain questions of identity, the writer would point out that specimens are not necessarily infallible vouchers of occurrence and that in the last analysis the main consideration is the integrity and exactitude of the collector or observer.

The utility of a specimen to the compiler of a list depends upon the label. A label may be attached to a wrong specimen in early stages of its preparation, or may be misplaced later. Aside from such hazards, labels may be deliberately switched, their legends may be untruthful or they may be wholly faked. Let any one who does not believe that such things occur glance through files of the minor ornithological magazines of the 80's and 90's.

Labels, in fact, have no absolute, but only a qualified value. And what is it that qualifies their reliability but the integrity of their writers? The thing that finally must be accepted or rejected is some individual's word, and the largest factor in the decision will be what is known of that person's dependability.

Waiving questions of subspecies, statements about the distribution of which are 90 per cent. or more rationalized anyway,[1] the recording of species of birds need not always be based on specimens, granted there are enough honest ornithologists. Would such a scientist's word need backing that he had seen an American egret, a marsh hawk, an English sparrow or a starling? or for that matter any of a majority of our birds? Must a scissor-tailed flycatcher or a magpie, unmistakable species, be collected to prove that they occurred somewhere far away from their normal ranges? If the observer's word without a specimen is to be rejected, how does it so increase in value as to be accepted by being written on a label? The whole question of the credibility of records is merely the integrity of the observer.

One might mention names to illustrate, pro and con, but that would be invidious. It is evident, however, that some ornithologists are too enthusiastic and "see things where they ain't," others are too credulous and lend the weight of their belief to statements that otherwise would get no hearing. Some are pundits and can not resist at least once in a while attempting to put something over by the sheer force of their authority—"If I say it's *tropicus* it is *tropicus*." Others are just plain run-of-the-mine bird students trying their best to learn correctly and record aright, and their word alone is as good evidence as can be obtained. The nature of these men is such that anything they seriously record will be based on critical investigation. Integrity and exactitude they have—all that is required.

Again let the writer say that he knows there are many questions that can not be settled without resort to specimens, or without collecting additional material, but that is not admitting that entries can not properly be made in a local list without specimens to back them up. When making bird lists for publication,

[1] That is, subspecific designations in bulk are copied from "authorities" and do not rest on specimens. Even the specimen identifications, as a whole, have to a large extent involved material other than breeders from the breeding ground, and thus not wholly valid for subspecific determination. That part of the science is intricate and can well be left to advanced systematists. Local lists would be a great deal more dependable than most of them have been if they ignored geographical races.

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PROPAGATION OF AQUATIC GAME BIRDS

U. S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

CONSERVATION BULLETIN 29

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Some Local Names of Plants—VIII

W. L. McATEE

Separately printed without change of paging from TORREYA
42: 153-168. November-December, 1942

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tened. Slim Madigan ran out to cover the deer-killers with his rifle. Reverend Withers leaped down from the coal pile to assist.

By this time another war was on. The fox hunt had brought Doc Mayers out to the road, straight into the arms of Mellisanda. He had tired quickly of the hunt and was headed for White Haven in the chariot. Mellisanda still cried, "Measles! Aren't no measles out here! Fine physician, fine minister of the gospel, fine game warden, we got! If there's a lunatic asylum of this Poconos, it must be White Haven!"

Slim Madigan placed the offenders under arrest. Under the pile of coal was found a fine doe deer. And as we walked our captives toward the car a long lanky figure slipped out of the brush, stretched long and lazily, spat, yawned, and finally grinned a silly buck-toothed grin. "We got'm, Rev'ren, didn't we? I told you, didn't I, these rats was up to no good? It's a trapper I am, not a hunter, but I pay for my license an—"

Thus spoke Rabbit-track Moses of the Poconos, in his inimitable style. What could we do but listen?

FATS FOR EXPLOSIVES

(Continued from page 20)

The answer is no. Since the Legislature, during the 1943 regular session, authorized their sale in Pennsylvania, deerskins when disposed of by the original owners within 90 days after the deer season are now in the same category as ordinary cow or horse hides and there is no restrictions on who may purchase or resell them.

The Commission interprets the intent of the Legislature to authorize the shipment, by the purchaser, of legally sold skins to commercial processing firms, either within or outside of the Commonwealth, without a permit of any kind.

Open-ness of the Primeval Forest

IN PENNSYLVANIA GAME NEWS for December 1936 (Vol. 7, No. 9, pp. 6-7), the undersigned summarized his views relative to the open-ness of the primeval forest. Popularly that woodland is supposed to have covered the entire eastern United States and to have been "impenetrable". However, testimony as to its open-ness is available in the works of early writers. Among them are: Thomas Morton who wrote of New England about 1620-1630. On this subject he said:

"The Salvages are accustomed, to set fire of the Country in all places where they come; and in barne it, twice a yeare X X X this custome of firing the Country is the meanes to make it passable, and by that meanes the trees growe bare, and there as in our parks: and makes the Country very beautifull, and commodious." (New English Canaan; or New Canaan, etc. (1632) Reprint 1838.)

Samuel Wilson whose history of Carolina was published in 1682.

"Near the Sea the Trees are not very large; They grow pretty neare together; farther up they are large and grow farther assunder; and are in most parts free from Underwood, so that you may see neare half a Mile, amongst the bodys of Large tall Timber Trees, whose tops meeting make a very plessing Shade. Yet hinders not Grass, Myrtle and other Sweet Scenting shrubs, here and there, from Growing under them: Among these groves of Timber Trees are have occasioned some that have seen them to compare Carolina to those pleasant parks in England, that have an abundance of tall Timber Trees unlopped; here you may hunt the Hare, Fox and Deer all day long in the here and there Savannas or Grassy planes of several Magnitudes clear of Trees which Shade, and freely spur your Horse through the Woods to follow the chase." (An Account of the Province of Carolina in America, etc. (1682). Hist. Coll., S. C. (B. R. Carroll), 2, 1836).

Thomas Ashe explorer of the Ohio River valley in 1806.

"The American forests have generally one very interesting quality, that of being entirely free from under, or brush wood. This is owing to the extraordinary height, and spreading tops of the trees, which thus prevent the sun from penetrating to the ground, and nourishing inferior articles of vegetation. In consequence of the above circumstance, one can walk in them with much pleasure, and see an enemy from a considerable distance." (Travels in America performed in 1806, for the purpose of exploring the Rivers Allegheny, Monongahela, Ohio, and Mississippi, 1808.)

These extracts throw a clearer light on the character of the original American forest. If it had not been open or contained many openings, it could not have produced the abundance of wildlife that tradition assigns to it.—W. L. McAtee, Fish and Wildlife Service, Chicago, Illinois.

Feeding fire fighters isn't part of the regulation Red Cross Canteen Corps training, but when fire raged in the mountainous area north of Reno, Nevada, last September, the Washoe County Canteen Corps was ready.

A telephone call at one o'clock in the morning was the first word Mrs. T. L. Withers, Canteen Chairman of the chapter, had of the disaster. Within an hour six canteen workers were on their way to feed the fighting men.

Working with four big gas stoves in a mobile kitchen set up under canvas by the Mono forest service, the women prepared steaks, sandwiches, coffee. The first canteen crew was relieved at six o'clock the following morning. This group worked 12 hours when another took over for the night.

The fire fighters came to the canteen kitchen in groups of 150, eating from long tables on which the supply of food was spread. The men carried packages of sandwiches and other food back to workers who were unable to get away.

New Types of Pens for Bobwhite Quail

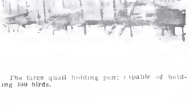
(Continued from page 14)

through a larger number of birds than it would if the same number of birds were kept in smaller units. Although such a danger should be recognized; nevertheless, the following facts are worth consideration:

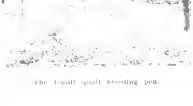
1. Inasmuch as the birds run on wire, they have little chance to get to their droppings. Likewise, an abundance of fresh air on all sides prevents much contamination of the atmosphere. Therefore, only direct contact with sick or dead birds, the drinking of polluted water, or the eating of contaminated feed could cause an epidemic. These possible sources of danger can be eliminated by prompt removal of ill birds or carcasses, and proper sanitary measures.

2. Whereas isolation of a disease outbreak is possible with a number of small units, this value can be quickly overbalanced by slipshod management. For example, lack of care in the handling of the water receptacles of the diseased birds and the rest of the stock can cause disease to be transmitted to every pen on the farm.

It is the authors' opinion that the large quail holding pen is a definite milestone on the road of progress towards the more successful propagation of quail for restocking purposes. Perhaps holding enclosures for quail similar to the enclosures now used at hatching pens for pheasants will be the next step in this important work. In the light of the question whether liberated captivity-reared quail can survive in the wild as successfully as wild birds, research along this line is vital.



The large quail holding pen; capable of holding 100 birds.



The 1-unit quail breeding pen.

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December 1943

FURTHER MEMORIES OF PROFESSOR F. E. L. BEAL

(1840-1916)

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AN OBSCURE WISCONSIN BIRD LIST

BY W. L. McATEE
Fish and Wildlife Service, Chicago, Ill.

The following reference seems to have escaped general notice:

Bruhin, Pastor Th. A., Die Vogel von New Coeln im Staate Wisconsin. Zoologische Garten, 16(11), October 1875, pp. 414-417.

It is listed by Coues **(Birds of the Colorado Valley, 1878, Bibliographical Appendix, p. 711)** who states, however, that he had not seen the paper.

The author terms it a brief catalog of the birds seen during six years and presents it as an aid toward appraising changes that might occur due to man's alteration of the environment. He possibly did not foresee how absolute these changes would be, for New Coeln is now only an old name for a part of greater Milwaukee.

Bruhin's references to periods of time are not clearly related to the "six years" but probably should be understood as dating back from 1875. He notes great reduction in the number of ruffed grouse due to farming operations and to hunting in a period of twenty years. Thirty years ago, he says, the bobolink was entirely unknown but since the land was cleared, there is hardly a field in which from one to several pairs do not breed. For some years the horned lark was very numerous, yet in the winter of 1874-75 one could travel for miles without seeing or hearing one. The probable cause was destruction of broods by heavy rains in 1874. Titmice **(Parus atricapillus)**, formerly rare, were plentiful last winter, he notes, and he adds: "in the summer of 1874 I found several species of **Dendroica** not previously observed." The most interesting example of sporadic occurrence was that of the golden plover which was observed in great numbers, May 2, 1875 (after a snowstorm on May 1), at three different places in Milwaukee County, where previously it had been seen seldom or not at all.

The list of the birds of New Coeln includes 103 definite specific entries, besides 5 that are queried, plus **Helminthophagae, Dendroicae,** and **Sieuri** unidentified, and 6 groups of domesticated fowls. Twenty-one are indicated as permanent or winter residents, but several others could have been so marked with equal correctness. Among forms of special interest are those of northern distribution **(Nyctea nivea, Picoides arcticus, Pinicola canadensis, Plectrophanes nivalis,** and **Corvus americanus.** The last is the raven **(Rabe)** which he says is at home in northern Wisconsin, but only transient in Milwaukee County); of southern affinities **(Centurus carolinus,** and **Cyanospiza cyanea)**; and on other grounds **(Ectopistes migratorius** and **Phalaropus hyperboreus).** He records **Carpodacus frontalis** in flocks in winter but this doubtless is a slip as he lists also **C. purpureus.**

Of considerable interest is his series of hawk names:

Falco tinnunculo similis
Falco polyagrus Cass.
Falco rubroscapularis mihi
Falco columbarius mihi
Falco vernalis mihi
Falco sparverius, L.
Buteo borealis
Haliaetus leucocephalus

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Reprinted from the Ohio Journal of Science
Vol. XLIII, No. 3, May, 1943

THE MECHANISM OF HEREDITY IN RELATION TO THE THEORY OF NATURAL SELECTION

W. L. McATEE
Fish and Wildlife Service, Chicago, Illinois

Darwin meant to deal with "hereditary modification" (?1912, p. 3) but he went on to include individual differences ("for they are often inherited," ibid., p. 38), which according to present information, are mostly noninheritable. Since these individual differences ("of the highest importance for us," ibid., p. 38) were postulated as the material upon which natural selection acts to produce organic modification, their prevailing noninheritance at once deals the theory a deadly blow.

As a practical consideration, vital to his theory, Darwin assumed that any variation may be inherited. In the field of individual variations, now called fluctuating variations, what is inherited is not particular variations but the tendency to vary more or less from the average racial standard. Fluctuating variations, the range of which remains about the same from generation to generation, reflect not exactness but rather the inexactness of heredity. Darwin evidently considered that all characters, all variations, of any organism are represented in its germplasm so that they may be inherited but this is now known not to be the case.

On this point D. H. Scott says, "The small variations which are so common, and on which the Darwinian tended to rely, as the material for natural selection to work on, have turned out for the most part to be mere fluctuations, oscillating about a mean, and therefore incapable of giving rise to any permanent new forms. Such fluctuating variations appear to depend on some action of the environment on the individual, and not to indicate differences in the germ-cells." (1924, pp. 10–11.)

Charles O. Whitman makes a far more sweeping statement contradicting the Darwinian view of heredity, saying: "There is really no transmission of characters anywhere in the organic world. . . . Parent and offspring are each independent developments, alike or different according as the germs from which they develop are alike or different, and according as the conditions of life are alike or different." (1919, p. 175).

THE CHARACTERS OF THE SOMA DO NOT AFFECT, AND MAY NOT REFLECT, THE CONSTITUTION OF THE GERM PLASM

When Darwin attempted to link the utility of a character with its inheritance, he was further misled. Among other ventures of this nature, he launched the following: "If variations useful to any organic being ever do occur, assuredly individuals thus characterized . . . from the strong principle of inheritance . . . will tend to produce offspring similarly characterized." (?1912, p. 115.) "variations, however slight . . . if they tend to be in any degree profitable . . . will generally be inherited by the offspring." (ibid., p. 55.)

Omitting comment on the question as to whether "variations, however slight" can be profitable, it should be pointed out that the "utility" of a character has no bearing on its hereditability. Inheritance depends upon the germ plasm while utility is an experience of the soma; there may be no connection. From this distinction ensue various considerations damaging to natural selection theory.

Without taking an extreme view as to the distinctness of somatic and germ cells (unwarranted, anyway, in the light of animal regeneration and vegetative propagation), it may be safely said, nevertheless, that in most organisms the germ plasm is a continuous stream from which the representatives of each generation derive, but upon which they do not have any effect, so far as known.

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EASTWARD MIGRATION THROUGH THE GULF ST

BY W. L. MC ATEE, THOMAS D. BURLEIGH, GEORGE H. LOWERY, JR.
AND HERBERT L. STODDARD

Reprinted from THE WILSON BULLETIN, vol. 56, No. 3, September, 1944, pp. 152–160.

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BIRDS PICKABACK

X-QL 3
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By Dr. W. L. MCATEE
Technical Adviser, Wildlife Service, U. S. Department of the Interior, Chicago, Ill.

Reprinted from THE SCIENTIFIC MONTHLY, March, 1944, Vol. LVIII, pages 221–226.

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Reprinted from THE AUK, Vol. 62, April, 1945, pp. 303, 304

Wettable water birds.—That cormorants and anhingas have many peculiarities in common is evident from accounts of their characteristics and relationships. One point that seems to have received little public notice is that, although highly aquatic in habits, these birds have plumage that is not very water-resistant but which in the course of their under-water activities becomes thoroughly wet. This wetting frequently proceeds so far that the birds are unable to fly and must crawl up on a perch where they can dry.

In the case of the anhinga, well-grown young, but largely in the natal down and still flightless, may leave their nests and climb to the tops of their nesting trees when disturbed by man. If further pressed, they plummet downward and swim rapidly away—a strange sight in crystal-clear water. Emerging, they climb on some snag in the vicinity, where their parents feed them until they are able to fend for themselves.

Extended field observations of both birds under a wide variety of conditions indicate that where rough fish and other acceptable aquatic animals are ordinarily plentiful, comparatively little time in and under water is required to satisfy their demands for food, even when there are hungry young to care for. This indicates extraordinary ability in the pursuit of prey, and precludes the idea that these birds are handicapped by the lack of impervious plumage. Their great fishing skill earns them much leisure and for hours on end they sun, preen, and stretch on the dead trees and other perches in the vicinity of their fishing grounds.

This getting bedraggled would appear to be a hiatus in their adaptation to aquatic life, which in various other respects seems so complete. Both groups have oil glands, but possession of those organs evidently is not the whole secret of the resistance of plumage to water. Most aquatic fowl, after submerging, pop to the surface where the little water they carry with them immediately rolls off; normally they are practically unwettable. Most of the these birds spend far more time in water than do the subjects of this sketch. The wettability of the cormorants and anhingas may indicate an even closer relationship between these groups than is currently admitted, one that possibly entitles them to rank as a suborder of the Steganopodes. Their obvious and great differences, however, inform us in this, as in so many other instances, that we are dealing with far-evolved entities—tip of twigs of the tree of life, of which the branches connecting them with the main trunk have been lost in the chaos of things that were.—W. L. MCATEE AND HERBERT L. STODDARD. *Chicago, Illinois, and Thomasville, Georgia.*

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matters of detail in a book of this kind, but it is a little disturbing to see a picture of the cyclotron with a sub-title: "Dr. E. O. Lawrence and associates at the University of California," when neither of the individuals shown happens to be Professor Lawrence.

On page 12 there is an implication, of course unintentional, that the droplets in a cloud chamber are produced by condensation on the charged ray which is under investigation rather than by condensation on the charged droplets resulting from ionization. However, such defects are of minor importance. The elementary reader will not be harmed, because the details of his picture must be incomplete anyhow, and the advanced reader will not be harmed, because he will make his own corrections. All in all, the author may be congratulated on producing a very clearly written volume useful for the purpose for which it is obviously intended.

W. F. G. SWANN
BARTOL RESEARCH FOUNDATION
OF
THE FRANKLIN INSTITUTE,
SWARTHMORE, PA.

BIOLOGICAL NAMES AND TERMS

A Source Book of Biological Names and Terms. By EDMUND C. JAEGER. xxvi + 256 pp. 96 figs. Springfield, Ill.: Charles C Thomas. 1944. $3.50.

THAT which we call a rose might still retain its sweetness by another name, but it would lose much of its charm for us nevertheless. Names may be fraught with meaning or they may be nonsense, as the author suggests in his dedication.

We are told that this rather slim volume contains some 12,000 elements from which biological names and terms are made. These, in alphabetical order, are explained, and examples are cited. According to the preface, this book surpasses in scope "many times the most complete collections in unabridged dictionaries and scientific glossaries and gives a key which unlocks the treasury of meaning of more than a million technical names and terms."

This volume is not a dictionary of technical terms, but, as the title says, a source book. All the more commonly known genera, many specific names and technical terms are included, from the standpoint of the elements of which they are composed. Geographical names and those based on modern personal names are not listed; nor are "ill-coined terms" of some "careless insect-anatomists and ecologists who have proved themselves to be word-butchers of the meanest sort." There is a discussion of a little over a page on "How Words Are Built." Some nine pages on word-formation of generic names are quoted from T. S. Palmer's "Index Generum Mammalium."

In the 256 pages which constitute the bulk of the book word elements are carefully considered, from "a-" which, as you probably know, has various meanings, including "a negative or absence of something," "from," "without," "away"; to "zyzz," which, as you probably don't know, means "zigzag." The origin of such elements, usually from the Greek or Latin, is indicated, often with notes of interest.

Ninety-six of the plants and animals are illustrated. Some of the drawings are original; many of those of plants are adapted from the author's book on "Desert Wild Flowers"; and some at least of the animals glint with expression—from wistful to smug.

Obviously this book contains a wealth of information on the derivation, meanings and uses of biological words and word elements. From it the student, to whom it seems to be more especially addressed, may learn the underlying significance of the names and terms of his science. The specialist may also profit by the opportunity for reflection on the original meanings of the vocabulary with which he graces or encumbers his field. Both may search in vain for more particular meanings of certain technical terms—but then, this is a source book rather than a dictionary.

EDWIN B. MATZKE
COLUMBIA UNIVERSITY

MAMMALS OF THE OLD WORLD

Extinct and Vanishing Mammals of the Old World. By FRANCIS HARPER. Special Publication No. 12, American Committee for International Wild Life Protection. xv + 850 pp., 1 pl., 67 figs. Baltimore, Md.: The Lord Baltimore Press. 1945.

IN 1942 appeared a companion volume devoted to mammals of the Western Hemisphere, prepared mainly by the late Glover M. Allen but with aid by Harper; in the present work, the proportions of contributions of the two authors are reversed. This volume is the larger by 230 pages and is more thoroughly illustrated. Together they constitute a record that mankind, being chiefly responsible for the extirpations, should view only with contrition, but which it is well both for laymen and scientists to have in permanent form. May it prove more than a pious hope that these books will stimulate action before it is too late for the preservation of some of the earth's most interesting creatures.

Already the hour has passed for more than a hundred kinds of mammals, 31 per cent. of which were exterminated during the preceding, and 67 per cent. in the present, century. The deadly work has thus attained a doubly accelerated pace. The volume here reviewed, though relating to only one hemisphere (the eastern), contains more summarizing statements than its predecessor. One of these itemizes the exterminations by countries and leading, to our sorrow,

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staff members can be educated in managemental procedures in general, in the minutiae of professional ethics and relations, in the differentiation of people and things, of personnel and materiel and their connections, in economic principles and trade knowledge, and in the psychology of the industrial mind. Relative emphasis accorded to the last-mentioned subject will gradually enable a young scientist of correct attitude to appreciate the commercial standpoint. It will teach him to convey to the industrial or business executive the ideas of science and the results of research in a manner and language that can be easily understood. Informed genial conversation is one of the best features of well-rounded professional life. In industrial research, especially in practical associations with company officers, the art of making and keeping contact and of promoting polite, tactful and friendly relations is of constant utility. It is of great aid in gaining essential cooperation and in securing the confidence that springs primarily from research accomplishment and technical merit. All successful industrial research as well as all successful professional and public relations are built upon trust. Among the foremost agencies for advancing research and its votaries are the scientific societies with their coordination, conventions and publications.

Research Demands in Human Relations

Scientific research has manifold societal and personal facts. In industry, for example, it is confronted with problems relating to workers as representatives of complex society as well as with problems involving interactions of workers and managers as individuals. In another type of problem study is being given to the recognition of the limit, if one can be found, beyond which production and distribution are likely to disturb the areas of industrial management and communal life. Applied physical science has been a very revolutionary and constructive factor in the industries, but to economists and sociologists concerned with the stability of communities it is of perturbing influence. Natural scientists could be of much aid to them in investigating that variation broadly along with other dynamic problems of improving human relations.

If after the readvent of peace we could produce and market goods at the same rate as in wartime, we should have the highest standard of living ever experienced, provided we could rightly solve our human relations enigmas. Of necessity in attacking these difficult questions is the correct and full use of scientific methods. We also need faith as well as facts and therefore psychological and ethical standards must be determined. To cite an instance, let us take the objective of personnel management research, which is the improvement of the understanding of people, of quality of judgment, of employee effectiveness and contentment and of corresponding techniques. Just as research is essential to all technologic progress, so is it indispensable to the advancement of personnel relations.

Many studies have been made on human problems of the industries, embracing sectors of their labor and public relationships, and discoveries in natural science have been stimulating in influence in all portions of the work; but much investigation remains to be performed to bring satisfactory results. It must be borne in mind that the activities in human relations have been too largely casual, the knowledge and experimentation too inadequate, to be comparable with the facts and methods of natural science. What needs to be done is apparent in general; how it shall be accomplished requires elaborate attention. We do know, however, that progress in human relations is dependent upon sufficient and efficient research on the value of what we have taken for granted, on the tendency and usefulness of change, and on new means to meet advantageously the real conditions of living and working to-day and to-morrow. This research must be conducted and its results utilized wisely if we are to pass the bounds, the numerous unsolved human problems, that hedge about us, little affected by ready measures of control. With science as the afterwar societal architect we could gain an economy and accompanying standards of human relations that would encourage the good life and thereby help importantly in preserving peace.

The United Nations organization has the unprecedented opportunity to foster research on defining the cogent relations among state and human interests and the facts of current reality, with the objective of evolving scientific means for bettering national and worldwide human relationships. Such a powerful action would stimulate the revival of fundamental investigation and also education in the universities, would inspire the improvement of public, institutional and technologic life in the postwar era. It would help to prevent the adaptation of science to adverse social philosophy; it would instead encourage an intelligent demand for science in the societal field and the development of a generally acceptable philosophy of science; it would thereby strengthen the realizable usefulness of scientific research. The United Nations could thus extend the versatility and creativeness of science and research to their own peacetime administration and promotion of progress, so as to invigorate and safeguard all that rightfully belongs to them as political bodies and to man as man.

Geographical Society, Ecological Society of America, Society of American Foresters, Society of Mammalogists and the Wildlife Society.

He is survived by Inez Muriel Hodges Palmer, to whom he was married at Fairbanks, Alaska, in 1934; there are no children.

W. L. MCATEE
FRANK DUFRESNE

SCIENTIFIC EVENTS

THE PROTECTION OF WILDLIFE IN GREAT BRITAIN

A MEMORANDUM drawn up by the British Ecological Society on wildlife conservation and ecological research from the national standpoint, as reported in *The Times*, London, states that the protection, scientific study and intelligent use and enjoyment of native plant life and animal life can only be brought about satisfactorily if the State takes a leading responsibility. It is pointed out that local or private bodies, however well informed, are not in a position to discover, or to hold, the correct balance between the complex and conflicting interests which are deeply involved in many wildlife problems. The memorandum reads:

There appears to be no other satisfactory method than to place the responsibility for advice and coordination upon a separate body acting under the Privy Council. It is recommended that a limited number of areas should be selected which are of sufficient scientific importance to warrant their acquisition by the State for the primary purpose of the conservation and scientific study of the principal types of plant and animal community represented in this country. These national reserves should be managed by a national service of conservators and wardens, under the direction of a national authority, who should proceed under powers similar to those employed for the acquisition of land for State forests. A national biological survey should be established to concern itself with the constantly changing wild and naturalized flora and fauna. This body should be charged with fact-finding, research and advice on the conservation, regulation, control and management of plant and animal life in Great Britain.

At least one general ecological research institute with suitable laboratories should be established by and under the powers granted to the proposed national authority. At this institute facilities should be provided for investigations by workers from the universities and the closest touch should be maintained between the institute and the university departments carrying on ecological research, including the development of humane methods of pest control. There should be established, under a Committee of the Privy Council, an Ecological Research Council as the national authority to cover the vast and hitherto neglected field of research. The pressing need is to extend the field of biological research beyond that now covered. With good sense and sound management overlapping of work or competition for money should never arise.

COMMISSIONS IN THE MEDICAL DEPARTMENT, REGULAR ARMY

1. The Surgeon General invites attention of all Medical Department officers and former officers, other than those retired, of both male and female component corps to War Department Circular 243, dated 10 August 1945. Subject: "Interests in Commissions in the Regular Army," a summary of which follows:

(a) Present indications are that a number of outstanding officers who have proved their capabilities in this emergency will be needed in the Regular Army peacetime establishment. Until appropriate legislation is enacted, the War Department can not announce the conditions which will govern selection of these officers or the number required. However, it is desired that officers who have served in the emergency, whether or not they are still on active duty, be given the opportunity of indicating their interest in obtaining a Regular Army commission. An officer making such a statement of interest may go off active duty or remain in the service without prejudice to his chances of being tendered a commission when legislation is enacted. It is the intention of the War Department that the fact that an officer has not remained in active service will not affect the grade to be offered or the position he will occupy on the promotion list.

(b) The plan for selecting and integrating officers into the Regular Army officers corps, as well as the size and composition of that corps, will finally be determined by Congress. The War Department will recommend that these officers integrated into the Regular Army be of such age and physical condition as will permit them to serve for a reasonably long period before being retired. No officer will be appointed in a grade higher than that which he held in wartime.

(c) The content of this circular will be brought to the attention of every officer at the earliest opportunity.

2. Officers currently on active military duty and who are interested in being considered for commission in the Regular Army, following enactment of appropriate legislation, may submit a statement of interest to their immediate commanding officer as outlined in the above mentioned circular.

3. Officers and former officers other than those retired who have served since 7 December 1941, and who have been relieved from active military duty under honorable conditions, may submit their statement of interest as outlined in the above mentioned circular direct to The Adjutant General, Washington 25, D. C.

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THE ORIOLE

A Quarterly Journal of Georgia Ornithology: Official Organ of the Georgia Ornithological Society

VOL. XI JANUARY, 1946 NO. 1

GEORGIAN RECORDS IN JOHN LATHAM'S "GENERAL HISTORY OF BIRDS," 1821-1824†

By W. L. McAtee

The "General History of Birds" has a formal closing (Vol. 10, 1824, pp. 455-456) in which the author says nothing of any systematic index such as he published for his "General Synopsis of Birds" (1781-1801, dates including the indexes and supplements), hence, apparently was content to leave the work with many species entered under English names alone. These were in effect descriptions of new species of which 28 were from Georgia. In addition, there were recorded from that State under scientific terms 173 nominal species of birds. The purpose of this paper is to identify these forms, so far as possible, and to list them according to present-day nomenclature.

Practically all of these Georgian records are based on specimens or drawings from John Abbot. Except for two birds* mentioned in the earlier "Synopsis," it is assumed that all Georgian records in the "History" are from Abbot and (errors eliminated) that every mention of Abbot indicates occurrence in Georgia. Originally it was hoped to make a complete list of birds and their vernacular names made known from the State by Abbot, but owing to present unavailability of some of the records (see notes in the list of literature), that plan had to be abandoned. Other sources of Abbotian data have been described by Rhoads, Faxon, and Allen, and the results of research as to Abbot's life in Georgia were pub-

† Published with the aid of a grant by the author.

* *Strix georgia*, Georgian owl (Gen. Syn, Suppl. ii, p. 64: Gen. Hist. 1:362) = *Strix varia georgica*; and *Numenius vociferus*, crying bird, crying ibis (Gen. Syn. Suppl. ii, p. 306; Gen. Hist. 9:152) = *Aramus scolopaceus pictus*.

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Reprinted from THE CONDOR, Vol. 48, January-February, 1946, Number 1, pp. 29-31

X-QL 3.M2
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THE ECONOMIC STATUS OF FLOCKING BIRDS

By W. L. McATEE

While not one of those who viewed the Passenger Pigeon in its glory, the writer has seen flights of other birds that stretched from horizon to horizon, as geese in Louisiana and blackbirds in Texas. The span of such a local horizon is not great, yet a broad, many-ranked flock of birds straggling across it comprises a vast number of individuals. There are enough of the blackbirds, one thinks, to clean up quickly all of the grain in a ricefield. That this does not happen more often appears to be a dispensation of fate as the possibility of total consumption of a crop is ever present. When there still were a few rice plantations in the Bobolink's autumnal flyway along the South Atlantic Coast, the writer saw hordes of these apparently insatiable "rice suckers" attack the grain so pertinaciously it seemed that every kernel would be milked. Only the most active and persistent defensive efforts enabled the planters to save a worth-while part of the crop.

The case of the Bobolink is, perhaps, an extreme example, but the fact remains that flocking species are responsible for most of the economic losses caused by birds. Thus the Division of Economic Ornithology and Mammalogy, forerunner of the Biological Survey, gave much attention in its early years to the depredations of ricebirds, blackbirds, the English Sparrow, Cedarbird, and the Crow. Among the publications it was deemed expedient to issue in the first score of years, those on the "Food of the bobolink, blackbirds, and grackles," "The relation of sparrows to agriculture," and "The horned larks and their relation to agriculture" dealt with typically flocking birds. The first release devoted chiefly to "control" of a bird was "How to destroy English sparrows" (1910). The discussion which follows is based largely on data contained in leaflets in the wildlife series issued by the Biological Survey and the Fish and Wildlife Service.

As time went on, demands for assistance in bird control increased but it remained evident that in most instances flocking species were at fault. Among them was the Piñon Jay, bands of which emerge from their usual haunts, the piñon-juniper covered hills, to damage near-by fields of grain. Of the White-necked Raven we read, "It is the gregarious habits . . . that make it capable of inflicting damage to unharvested crops," particularly grain sorghums, corn, melons, and peanuts. Horned Larks, especially in California, damage vegetable and seed crops in their early stages when the population of the birds in the farming valleys is increased by influx of old and young after the breeding season in the surrounding foothills. Unusual culprits are the flocks of shore-feeding Herring Gulls that sometimes leave the beach and ravage the blueberry crop in Maine, and the Cape May and Tennessee warblers, ordinarily highly insectivorous, which puncture grapes to a serious extent when collected in numbers on their southward migrations. It is, of course, flocking birds that become obnoxious by roosting where not wanted and whose objectionable presence has called for much study as to means of dislodging the roosts or destroying the birds. These comprise chiefly Starlings, blackbirds, and feral pigeons, but sometimes also such more desirable species as Purple Martins and Robins. Continued attention to depredation on grains by blackbirds has been required and special groups of birds in California have occasioned losses so great that organized study and cooperative control have been necessitated.

Again these are mostly flockers, including the blackbirds and Horned Larks, previously mentioned, the House Finch which attacks buds, fruit, and even grains, and the

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Some Local Names of Plants—IX

W. L. McATEE

Privately printed 1946

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Torpidity in Birds

W. L. McATEE

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Luminosity in Birds

W. L. McATEE

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#35

Reprinted from
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Vol. 38, No. 1, pp. 207-213, July, 1947

The University Press
Notre Dame, Ind.

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Distribution of Seeds by Birds

W. L. McATEE

X-QL 3 .M2
#92

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Vol. 38, No. 1, pp. 214-223, July, 1947

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Reprinted from JOURNAL OF THE NEW YORK ENTOMOLOGICAL SOCIETY,
Vol. LV, September, 1947, pages 205–206.

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POPULAR NAMES OF GYRINIDÆ

In 1926 (Entomological News, 37: 269), the writer listed five vernacular names for these water beetles. More than thrice that number can now be cited and it seems desirable to assemble them in print as a possible stimulus to some historically inclined entomologist to undertake the collection of folk names of insects. As one who has collected bird names for a generation, the writer can recommend this as an interesting and rewarding field.

Per Kalm, whose broad sympathies led him to record the first observations aloug varied lines of American natural history, in his journal entry for April 13, 1749, noted "vatteubaggen (*Dytiscus natator*)." The translators have made free with this term, which meaus only "water-beetle." Thus a French interpreter rendered it "tourniquet" (a turning thing), a Dutch one as "zweemer" (swimmer), and an Englishman as "whirl beetle."

John D. Godman, author of "Rambles of a Naturalist," whose wanderings were in the neighborhood of Philadelphia, said in 1830 (Waldie's Library, 2: 85) that they are "called by the boys the water-witches and apple smellers," and that they have "a delightful smell exactly similar to that of the richest, mellowest apple." Confirmation of the existence of this pleasant aroma occurs in the oft-quoted "Swallow Barn" (John P. Kennedy, 1832, 1: 129), where we read, "The apple-bugs (as schoolboys call that glossy black insect which frequents the summer pools, aud is distinguished for the perfume of the apple) danced in myriads over the surface of the still water." Mellow-bugs and sugar-bugs are names of the same origin.

The dancing alluded to, familiar to all entomologists as well as to many of the general public, a swift darting in intersecting curves, each leaving a momentary wake upon the water, accounts for two of the Kalm-associated names, for the water-witch of Godman, and also for such terms as scuttle bugs, whirligigs, aud whirligig beetles. Of quite different origin must be the names penny bugs, dollar bugs, and lucky bugs; the first two of these may have been suggested by the ovate shape, or all of these terms may have an allied and obscure significance. In the writer's ex-

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Reprinted from THE SCIENTIFIC MONTHLY
Vol. LXV, No. 3, September, 1947

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THE CATS-TO-CLOVER CHAIN

By W. L. McATEE

For more than forty years Mr. McAtee was a member of the Fish and Wildlife Service (U. S. Department of the Interior), where he made a reputation in economic ornithology and systematic entomology. His studies of blind fishes caused him to doubt much natural-selection doctrine, and his investigations of the food habits of birds led him to challenge it. A book manuscript, "A Critique of Darwinism," has found no publisher, however. His principal task and pleasure at sixty-four is the preparation of "A Dictionary of American Bird Names."

AT LEAST every hundred years or so, the arguments of science should be re-examined. Among natural-selection speculations, a few have been time-revised, and it is proposed to deal with another here. The doubted remarks are contained in the following disquisition by Charles Darwin on the pollination of heartsease and red clover.

> Humble-bees alone visit red clover, as other bees cannot reach the nectar. It has been suggested that moths may fertilize the clovers; but I doubt whether they could do so in the case of the red clover, from their weight not being sufficient to depress the wing petals. Hence we may infer as highly probable that, if the whole genus of humble-bees became extinct or very rare in England, the heartsease and red clover would become very rare, or wholly disappear. The number of humble-bees in any district depends in a great measure upon the number of field-mice, which destroy their combs and nests; and Col. Newman, who has long attended to the habits of humble-bees, believes that "more than two-thirds of them are thus destroyed all over England." Now the number of mice is largely dependent, as every one knows, on the number of cats; and Col. Newman says, "Near villages and small towns I have found the nests of humble-bees more numerous than elsewhere, which I attribute to the number of cats that destroy the mice." Hence it is quite credible that the presence of a feline animal in large numbers in a district might determine, through the intervention first of mice and then of bees, the frequency of certain flowers in that district.[1]

In examining the quoted passage, the first need is for a polite way of contradicting one hailed as practically infallible. However, we may say with respect to the assertion "Humble-bees alone visit red clover, as other bees cannot reach the nectar" that, as a whole, it involves a *non sequitur* and that the first part of it is untrue. The basis for these strictures will come out in discussion of the inclusive topic of the role of what in America are called "bumblebees" in pollinating heartsease (*Viola tricolor*) and red clover (*Trifolium pratense*). Darwin says: "We may infer as highly probable, that if the whole genus of humble-bees became extinct or very rare in England, the heartsease and red clover would become very rare, or wholly disappear." This statement ignores the fact that the smaller, paler-flowered forms of *V. tricolor* are regularly self-pollinated (letter from J. W. Dutton, Ministry of Agriculture, London, January 21, 1935) and that honeybees are active pollinators of *T. pratense*.

Experience with red-clover pollination in England, where honeybees are maintained in numbers, can scarcely differ from that in the United States. Here, in an investigation by the Colorado Experiment Station,

> Honeybees were found to be carrying red-clover pollen. A large percentage of the bees observed were active pollinators of red clover. These insects are a major factor in pollination of this plant in Colorado, east of the mountains. [The author adds]: The length of the corolla tube apparently has no bearing on red-clover pollination by honeybees.[2]

Federal Department of Agriculture authorities bear out the last remark, saying, "Honeybees visit red clover principally for pollen and seldom obtain nectar, but regard-

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COMMENTS

by Readers

The title "Annual Dispersal over Land Bridges" was omitted

Invitations to the 6th International Congress of Experimental Cytology to be held at Stockholm in 1947 carry the notice that it will not be open to German and Japanese scientists.

Those German and Japanese scientists that may have been accused of criminal actions in the past have been subjected to the legal procedures instituted by the allied nations in the occupied countries. Those that have been found guilty are subject to punishment like any other criminals and it is obvious that such men will not be able to attend the Congress.

We protest that the exclusion of scientists merely on the basis of their nationality is contrary to one of the fundamental tenets of the scientific creed. It belies the very name of the Congress and controverts its aims.

It is hoped that this tragic mistake, so similar to many that were made by scientists after the first world war, will not be allowed to stand. We beg that the restriction be lifted at once. (TH. DOBZHANSKY, SELIG HECHT, FRANZ SCHRADER, and G. G. SIMPSON, *Columbia University.*)

The holding of international conferences this year has agitated the question regarding the participation of scientists from the former Axis countries, particularly Germany. Scientists in the past generally have been able to remain aloof from the psychology of enmity and war. A change came with Hitlerism. Today, our hesitation at accepting Germans to our conferences emanates not from the effects of actual combat but from the deeds which were performed by the German Government for years before the war and which attained their vilest proportions during the war. Every German who survived without protest against the regime he lived under must accept responsibility, be it of a lesser or greater degree, for the terrible fact that our present-day civilization has witnessed the official enactment of bestiality in a country we had learned to respect as enlightened.

I understand that some Germans are being invited to attend the conferences, the selection being limited to those who underwent physical suffering because of the stand they took against Nazism. Doubtless many endured mental suffering. We are sorry for them. We regret that there must be some who suffered persecution but, because of physical limitations of the several committees, are not on invited lists. We trust that, in time, the elimination of the perpetrators of Nazism and the delusions of the Nazi doctrine will gradually bring the German people back to a state of mind which will permit them to be respected again by the rest of the world.

Anyone approving of the decision taken by the International Congress of Experimental Cytology being held in Stockholm this summer, is invited to send a letter of confidence to the Congress for the stand which it has taken. (ROBERT CHAMBERS, *New York University.*)

In the issue of April 4 Sally Hughes-Schrader protests against the exclusion of "German and Japanese *colleagues*" from international scientific congresses "on such *unscientific ground* as nationality" (italics mine). . . . No *international* congress should admit the subjects of a nation that discriminated against the Nobel Prize, the highest known international award, because of its international character; of a nation that denies Hughes-Schrader's sentence that "science transcends considerations of nationality, as of race, color, and creed." No *scientific* congress should admit the subjects of a nation that falsified scientific facts, and called murder scientific investigation . . . if German or Japanese subjects beg to be admitted to international meetings, may they be given the opportunity to prove that they disapprove *in public* of the Nazi behavior, and those who did so will be welcomed as men and scientists. The participation of other German or Japanese individuals will do good neither to science nor to humanity. (F. L. HAHN, *Apart. Post. 9622, Mexico, D. F.*)

The processes of evolution have required very long periods of time. A renewed impression of their near infinitude has been received from reading a discussion of the dispersal of faunas over land bridges. Those bridges were available during only fractions of evolutionary time and certainly were ecologically restricted in contrast to the continents connected. As animals cannot migrate for long distances over territory lacking their ecological requirements, the land bridges cannot be regarded as having been highways suitable for all to travel throughout their existence.

Another great retarding factor, which apparently has not been taken into consideration, is the highly sedentary nature of animal populations. As a rule, they remain on the ancestral range. The movements of individuals are limited, many passing their entire lives in an area of a few acres or less. With attachment to the home range so dominant, it is evident that animal populations, as a whole, could not move, or even be forced to move, at more than a glacial rate. Eons, no less, would be required for far-flung migrations of fauna.

True, there is also a dispersive factor; barriers permitting, animals do extend their ranges. But along with revelation by modern studies of the essential stability of populations, it has also been shown that animals leaving the home range suffer very high mortality. The young, among which centrifugal wandering is often evident, suffer a high proportion of the entire mortality of their species. Although some of them succeed in establishing themselves, usually in vacancies in the hereditary domain, this occurrence does not controvert the impression that the occupation of new territory is normally a very gradual process and, therefore, that extensive transfer of faunas by land bridges must have been an infinitely slow process. (W. L. MCATEE, *5750 Ellis Avenue, Chicago, Illinois.*)

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Reprinted from
THE JOURNAL OF WILDLIFE MANAGEMENT
Vol. 11, No. 3, July, 1947

OBITUARY

WALTER CLEAVELAND HENDERSON
1876–1947

Walter Cleaveland Henderson, who joined The Wildlife Society during its first year and was elected to the Active class in 1938, remained in our ranks for the rest of his life. He died of coronary thrombosis in St. Petersburg, Florida, January 1, 1947, and was buried there.

Mr. Henderson was born in Chelsea, Massachusetts, on July 6, 1876, and was educated in the Chelsea and Somerville public schools and in Boston University Law School from which he was graduated (LLB) in 1903. He had already entered the Federal Service and was employed in the Customs Service of the Treasury Department from 1897 until 1907, when he was appointed law clerk in the Forest Service, Department of Agriculture. Later he became assistant to the Solicitor of that Department and on December 1, 1916, was transferred to the Bureau of Biological Survey as Assistant Chief. In 1927 he was made Associate Chief and upon the consolidation in 1940 of the Biological Survey with the Bureau of Fisheries to form the present Fish and Wildlife Service, he was made Assistant Director. Suffering some impairment of health, evidenced principally by sciatica, he did not move to Chicago with the bulk of the Bureau in 1942, but retired on November 30 of that year. His span of Government service was 45 years.

Mr. Henderson was Chairman of the War Memorial Committee of the U. S. Department of Agriculture, through whose inter-

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Chicago, Illinois
October 1947

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Possible Check-List Additions From Greenland

BY W. L. McATEE

IN volume two (1926) of his monumental work on "Danmarks Fugle," Schiøler reviewed (pp. 1–30) writings on the birds of Greenland from the earliest times to 1925. In a chapter on climate and ecology in relation to the avifauna, he included a list (Literature Cited, No. 2) of 158 species and subspecies of birds known from that great northern island.

Reviewing this book in The Auk for April 1926, Glover M. Allen concluded that "The work . . . must be taken into careful consideration in any review of American birds" (p. 227). Commenting on volume three (Auk, 48, 1931, p. 458), Dr. Allen noted among other things: "Schiøler has made a minute study of representative series of northern birds and as a result has recognized many local subspecies that workers with less extensive material might not; thus he regards the Longspur and the Snow Bunting as recognizable races, reviving for them Brehm's names, ***Calcarius lapponicus groenlandicus*** and ***Plectrophenax nivalis subnivalis*** respectively; he has also described the Greenland Merganser as ***Mergus serrator major.***"

To the reader of our Check-List and its supplements, these are strange names. As a source of additions to the nearctic list of birds, Greenland is as favorably situated in the northeast as are the Pribilof Islands to the northwest and every record from the latter locality has been treasured.

X-QL 31
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On the Physiology of Reef Corals

I. On the Oxygen Exchanges of Reef Corals

II. The Effect of Light on Colour and Form of Reef Corals

III. Regeneration and Phototropism in Reef Corals

By

Siro KAWAGUTI

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From the Palao Tropical Biological Station Studies, No. 2

TOKYO
THE JAPAN SOCIETY FOR THE PROMOTION
OF SCIENTIFIC RESEARCH
1937

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On the Physiology of Reef Corals

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OF SCIENTIFIC RESEARCH
1937

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On the Physiology of Reef Corals
IV. The Growth of *Goniastrea aspera* Measured from Numerical and Areal Increase of Calyces

By

Siro KAWAGUTI

From the Palao Tropical Biological Station
Studies, Vol. II, No. 2

TOKYO
THE JAPAN SOCIETY FOR THE PROMOTION
OF SCIENTIFIC RESEARCH
1941

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On the Physiology of Reef Corals
IV. The Growth of *Goniastrea aspera* Measured from Numerical and Areal Increase of Calyces

By

Siro KAWAGUTI

From the Palao Tropical Biological Station Studies, Vol. II, No. 2

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THE JAPAN SOCIETY FOR THE PROMOTION
OF SCIENTIFIC RESEARCH
1941

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Siro KAWAGUTI

HEMERYTHRIN FOUND IN THE BLOOD OF *LINGULA*

Reprinted from the
Memoirs of the Faculty of Science and Agriculture,
Taihoku Imperial University, Vol. XXIII, No. 2.
ZOOLOGY No. 12.
February, 1941.

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Siro KAWAGUTI

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HEMERYTHRIN FOUND IN THE BLOOD OF *LINGULA*

Reprinted from the
Memoirs of the Faculty of Science and Agriculture,
Taihoku Imperial University, Vol. XXIII, No. 2.
ZOOLOGY No. 12.
February, 1941.

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X-QL 31.K2
#46

On the Physiology of Reef Corals
V. Tropisms of Coral Planulae, Considered as a Factor of Distribution of the Reefs

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By

Siro KAWAGUTI

From the Palao Tropical Biological Station Studies, Vol. II, No. 2

TOKYO
THE JAPAN SOCIETY FOR THE PROMOTION
OF SCIENTIFIC RESEARCH
1941

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On the Physiology of Reef Corals
V. Tropisms of Coral Planulae, Considered as a Factor of Distribution of the Reefs

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By

Siro KAWAGUTI

From the Palao Tropical Biological Station Studies, Vol. II, No. 2

TOKYO
THE JAPAN SOCIETY FOR THE PROMOTION
OF SCIENTIFIC RESEARCH
1941

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Study on the Invertebrates Associating Unicellular Algae
I. *Placobranchus ocellatus* von HASSELT, a Nudibranch

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By

Siro KAWAGUTI

From the Palao Tropical Biological Station Studies, Vol. II, No. 2

TOKYO
THE JAPAN SOCIETY FOR THE PROMOTION
OF SCIENTIFIC RESEARCH
1941

X-QL 31
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Study on the Invertebrates Associating Unicellular Algae
I. *Placobranchus ocellatus* von HASSELT, a Nudibranch

X-QL31.K2
#151

By

Siro KAWAGUTI

From the Palao Tropical Biological Station Studies, Vol. II, No. 2

TOKYO
THE JAPAN SOCIETY FOR THE PROMOTION
OF SCIENTIFIC RESEARCH
1941

X-QL 31
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X-QL31.K2
#72

Zooxanthellae as a Factor of Positive Phototropism in Those Animals Containing Them

By

Siro KAWAGUTI

From the Palao Tropical Biological Station Studies, Vol. II, No. 4

TOKYO
THE JAPAN SOCIETY FOR THE PROMOTION
OF SCIENTIFIC RESEARCH
1944

X-QL 31
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Zooxanthellae as a Factor of Positive Phototropism in Those Animals Containing Them

X-QL 31.K2
#53

By

Siro KAWAGUTI

From the Palao Tropical Biological Station Studies, Vol. II, No. 4

TOKYO
THE JAPAN SOCIETY FOR THE PROMOTION
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